Ginkgo biloba is the scientific name of a type of woody plant with fan-shaped leaves of Ginkgoaceae family (ginkgo). The chemical components of the extracts from ginkgo leaves are also tested. The name and structure of ginkgolides in Ginkgo biloba is shown in Figure 2. Both types of bilobalides and ginkgolides are the main components of Ginkgo biloba which exhibit all biological and/or pharmacological activities of Ginkgo biloba. However, it is not clear about the fundamental mechanism of the molecules also in interaction with pharmaceuticals during such treatment. Kaempferol is a metabolite of quercetin and isorhamnetin is a metabolite of kaempferol. The commercial Ginkgo biloba of Ginkgo biloba leaves is enriched with water-acetone or water-ethanol of the extract from ginkgo leaves, and standardized to their flavonoid contents or three times thereof. These components can induce such effects as mental alteration and memory improvement for their characteristics of promoting neuronal growth and the flavanol antioxidants of Ginkgo biloba.

Pharmacological efficacy of Ginkgo biloba: Ginkgo biloba is effective in the treatment of coronary artery disease, arrhythmia, diabetic cardiomyopathy, dementia, and cerebral infarction, and lipid regulation.

To combine the above ingredients for synergistic effects, the composition of the present invention prepared according to the solid lipid nanotechnology comprises multiple lipid drug conjugate nanoparticles (LDCN). Currrently, this has been the most modern nano-drug formulation technology. The technology can allow the loading of multiple pharmaceutical ingredients in the nanoparticles. Such lipid nanoparticles have co-bioavailability, and treatment efficacy in accordance with the conjugate potentiation effect, resulting in great therapeutic effectiveness.

Summary of the Invention

The objective of the present invention is to provide an organic sol-gel nano-composition comprises the following components:

(a) Solid lipid nano Ginkgo biloba: 15-30%;

(b) Solid lipid nano rutin: 2.78%;

Detailed Description of the Invention

The organic sol-gel nano-composition according to the invention comprises the following components:

(a) Solid lipid nano Ginkgo biloba: 15-30%;

(b) Solid lipid nano rutin: 2.78%;

(C) Solid lipid nano Panax notoginseng saponins: 13.89%;

(d) Soy bean oil: 40-65%;

(e) Lecithin: 1-10%

(f) Tween 80: 0.1- 5%

Panax notoginseng saponins (PNS) is extracted from Vietnamese Radix notoginseng (Panax pseudo-ginseng) with ethyl alcohol solvent.

Panax Notoginseng Saponins (PNS) solid lipid nanoparticles purchased from Vietlife Nano Biological Manufactory have the following parameters: an average nanoparticle size of 9.94 nm, and the PNS content in nanoparticles is over 22%.

Rutin is extracted in ethyl alcohol solvent from Styphnolobium japonicum (Sophora japonica) from Thai Binh province.

Rutin solid lipid nanoparticles purchased from Vietlife Biological Nano Manufactory have the following parameters: an average nanoparticle size of 11.25 nm, and the rutin content in the nanoparticles is over 22%.

Ginkgo biloba is purchased from Shaan Meihe Biochemics Co. Ltd (China).

Solid lipid Ginkgo biloba (GBLB) nanoparticles purchased from Vietlife Biological Nano Manufactory have the following specifications: an average nanoparticle size of 9.943 nm, and the GBLB content in the nanoparticles is over 22%.

In addition, there are included excipient materials such as glyceril monostearate, stearic acid, magnesium stearate, Tween 80, lecithin, Gac oil, and soybean oil. All of

CLAIMS

1. An organic sol-gel nano-composition containing Panax notoginseng saponins, rutin, and Ginkgo biloba effective in enhancing cerebral and cardiovascular protection, in which the composition comprise the following:

(a) solid lipid nano Ginkgo biloba: 15-30%;

(b) solid lipid nano rutin: 2.78%;

(c) solid lipid nano Panax notoginseng saponins: 13.89%;

(d) soy bean oil: 40-65%;

(e) lecithin: 1-10%;

(f) Tween 80: 0.1- 5%.

2. A process for preparing the composition of claim 1, comprising the following steps:

(i) preparing a carrier solution: soy bean oil is added to a reaction flask under heating at 70-100^{o}C, preferably 80^{o}C, and evenly stirred at 250-350 rpm, preferably 300 rpm; then lecithin is added to the reaction flask, boiled and stirred until complete dissolution; after about 30-50 minutes, preferably 45 minutes, the surfactant Tween 80 is further added to the flask, mildly boiled and evenly stirred for about 80-100 minutes, preferably 90 minutes until the carrier solution becomes transparent;

(ii) preparing a conjugated lipid nano-presuspension of three active ingredients/carriers: solid lipid nano Panax notoginseng saponins are slowly added to reaction flask, maintained at 80-90^{o}C under fast stirring at 400-600 rpm, preferably 500 rpm, stirred and boiled until the solid lipid nano Panax notoginseng saponins are completely dissolved; solid lipid nano rutin is further added, maintained at the same temperature and stirring speed until the solid lipid nano rutin is completely dissolved, then, solid lipid nano Ginkgo biloba is added thereto while maintaining the same temperature and stirring speed until the solid lipid nano Ginkgo biloba is completely dissolved;

(iii) preparing a conjugated pre-sol-gel lipid nano-composition of three active ingredients: the carrier mixture containing three solid lipid nano components is mixed in about 3-24 hours, wherein the reaction time depends on the content of each product batch: in lab for about 3 hours, semi-industrial production for about 7 hours, and industrial production for 18-24 hours;

iv) preparing a conjugated sol-gel lipid nano-composition of three active ingredients: adjust the contents of the organic sol-gel components to achieve the standard technical parameters including the contents of Panax notoginseng saponins, rutin, and Ginkgo biloba; and

(v) obtaining a finished composition: the gel formation at gel resolution temperature comprises gelation at normal temperature (room temperature) and storage temperature (below 24^{o}C), and gel resolution at 35-37^{o}C (human body temperature).